glucosyltransferase-2 protein and wherein said immunogenic composition does not comprise intact *S. sobrinus* glucosyltransferase-2 protein.

REMARKS

Claim Amendments

Claims 29, 30, 39, 40, 49, 50, 59, 60, 69, 70, 79 and 80 have been cancelled. Claims 20, 24, 31, 34, 41, 44, 51, 54, 61, 64, 71 and 74 have been amended to clarify the amino acid numbering for each glucosyltransferase and recite that the immunogenic compositions do not comprise the intact glucosyltransferase. Support for this amendment can be found throughout the specification, in particular, page 3, lines 5-7, page 8, lines 16-18 and lines 29-31, and Table 1. No new matter has been added.

Rejection of Claims 20, 23, 24, 26-31, 33, 34, 36-41, 43, 44, 46-51, 53, 54, 56-61, 63, 64, 66-71, 73, 74 and 76-80 under 35 U.S.C. § 112, Second Paragraph

Claims 20, 23, 24, 26-31, 33, 34, 36-41, 43, 44, 46-51, 53, 54, 56-61, 63, 64, 66-71, 73, 74 and 76-80 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention.

The Examiner states that "[t]he instant claims are drawn to a composition comprising ≥1 peptide comprising an amino acid chosen from aspartate 562, aspartate 567, histidine 561, tryptophan 491, glutamate 489, and combinations thereof," and that "[i]t is unclear what is the difference between the two aspartates or between the listed amino acids and other aspartates, histidines, tyrptophans, or glutamates." The Examiner further states that "[t]he positions of the claimed amino acids are indefinite," and that "the specification does not teach the complete sequence or starting points of any of the whole glucosyltransferases". The Examiner also states that "[i]t is unclear what sequences are being utilized for the whole glucosyltransferases."

Applicants note that the claims have been amended herein to even more clearly indicate that the amino acid positions recited in the claims are the position numbers for the amino acids in the protein which is recited in a particular claim. The Specification clearly indicates (e.g., with a footnote to Table 1) that the sequences utilized as a basis for the numbering of the recited amino

acids are the protein sequences provided in the five references listed at the end of Table 1. Accordingly, one of skill in the art would clearly recognize that the amino acids recited in a particular claim are defined by their position in the intact protein recited in that claim with reference to the amino acid sequence of the protein as shown in the cited references. Table 1 provides a further point of reference for the recited residues by indicating the position number of the beginning amino acid for each peptide shown.

In view of the above, one skilled in the art, having Applicants' specification and claims before him, would be able to discern with a reasonable degree of certainty the subject matter of the claims. Thus, Applicants respectfully submit that the claims, as amended, even more particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Reconsideration and withdrawal of the rejection are respectfully requested.

Rejection of Claims 26, 27, 36, 37, 46, 56, 57, 66, 67, 76 and 77 under 35 U.S.C. § 112, First Paragraph

Claims 26, 27, 36, 37, 46, 56, 57, 66, 67, 76 and 77 are rejected under 35 U.S.C. § 112, first paragraph, because the Examiner asserts that the specification, while being enabling for immunogenic compositions consisting of EAW (SEQ ID NO. 1), HDS (SEQ ID NO. 2), MAC (SEQ ID NO. 4), or GTFsm, does not reasonably provide enablement for constructs further comprising portions of pathogens.

Applicants respectfully traverse this rejection. The Specification provides direction regarding various ways of enhancing immunogenicity of vaccine and immunogenic compositions such as combining with immunogenic portions of pathogens (*e.g.*, diptheria, pertussis, tetanus, measles and polio virus), proteins (such as tetanus toxoid) or carriers (such as a synthetic polymer carrier). See Specification, page 10, lines 7-13. Portions of pathogens are routinely used in the art in the preparation of immunogenic compositions and vaccines, and the Examiner has indicated that covalently linking peptides is well known. Thus, the experimentation required, if any, is minimal.

Thus, Applicants have sufficiently enabled the skilled person to practice the invention without undue experimentation, satisfying the requirements of the first paragraph of 35 U.S.C. § 112. Reconsideration and withdrawal of the rejection are respectfully requested.

Rejection of Claims 29, 30, 39, 40, 49, 50, 59, 60, 69, 70, 79 and 80 under 35 U.S.C. § 112, First Paragraph

Claims 29, 30, 39, 40, 49, 50, 59, 60, 69, 70, 79 and 80 are rejected under 35 U.S.C. § 112, first paragraph, because the Examiner alleges that the specification, while being enabling for immunogenic compositions consisting of EAW (SEQ ID NO. 1), HDS (SEQ ID NO. 2), MAC (SEQ ID NO. 4), or GTFsm for production of antibodies in rats, does not reasonably provide enablement for compositions which induce immune responses resulting in the reduction of the colonization or accumulation of mutants streptococcal strain in a mammal or for vaccine compositions.

Applicants have cancelled the rejected claims, rendering the rejection moot.

Rejections of Claims under 35 U.S.C. § 112, First Paragraph

Claims 29, 30, 39, 40, 49, 50, 59, 60, 69, 70, 79 and 80 are rejected under 35 U.S.C. §112, first paragraph, for reciting the limitation "the vaccines" in line 3.

Applicants have cancelled the rejected claims, thus rendering the rejection moot.

Rejection of Claims 21, 22, 25, 32, 35, 42, 45, 52, 55, 62, 65, 72 and 75 under Judicially Created Doctrine of Obviousness-type Double Patenting

Claims 21, 22, 25, 32, 35, 42, 45, 52, 55, 62, 65, 72 and 75 under are provisionally rejected under the judicially created doctrine of double patenting as being unpatentable over claims 12, 13, 14 and 15 of copending Application No. 09/562,328.

The Examiner states that although the conflicting claims are not identical, they are not patentably distinct from each other because the instant claims are drawn to a composition comprising at least one peptide comprising SEQ ID NO: 1, 2, 3, 10, 11, 12, 13, 14, 15, 16, 17, 18 and 19 which are identical to SEQ ID NO: 20, 27, 22, 23, 24, 25, 27, 29, 30, 31, 32 and 37 of copending Application No. 09/562,328.

Applicants note the provisional rejection. However, Applicants respectfully request that the guidance provided by MPEP § 804 be followed, and request that a reply to the merits of this provisional rejection be postponed until either the 09/562,328 application issues as a patent or until the rejection is the only rejection remaining in the subject application.

Rejections of Claims 20, 21 and 22 under 35 U.S.C. § 102 (b)

Claims 20, 21 and 22 are rejected under 35 U.S.C. § 102 (b) as being anticipated by Kuramitsu, *et al* (Reference U) The Examiner states Kuramitsu *et al.* teach an immunologic composition comprising purified glucosyltransferase-B of *S. mutans*.

Applicants note that Claims 20, 21 and 22 have been amended to recite that the composition does not comprise intact *S. mutans* glucosyltransferase-B protein. Kuramitsu *et al.* produce antibodies which bind the full length of glucoslyltransferase-B of *Streptococcus mutans*. Kuramuitsu *et al.* does not provide any teaching or suggestion of immunogenic compositions comprising an amino acid sequence subunit (i.e., less than the intact protein) of *S. mutans* glucosyltransferase-B which do not comprise intact glucosyltransferase-B.
Thus, Kuramitsu *et al.* does not anticipate Claims 20, 21 and 22, as amended. Reconsideration and withdrawal of the rejection are respectfully requested.

Supplemental Information Disclosure Statement

A Supplemental Information Disclosure Statement (SIDS) is being filed concurrently herewith. Entry of the SIDS is respectfully requested.

CONCLUSION

It is believed that all claims are in condition for allowance, and it is respectfully requested that the application be passed to issue. If the Examiner feels that a telephone conference would expedite prosecution of this case, the Examiner is invited to call the undersigned at (978) 341-0036.

Respectfully submitted,

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MARKED UP VERSION OF AMENDMENTS

Claim Amendments Under 37 C.F.R. § 1.121(c)(1)(ii)

20. (Amended) An immunogenic composition comprising at least one peptide which is an amino acid sequence subunit of *S. mutans* glucosyltransferase-B which is of sufficient length to raise an immune response in a mammal to whom it is administered comprising an amino acid selected from the group consisting of aspartate 562, aspartate 567, histidine 561, tryptophan 491, glutamate 489, and combinations thereof, wherein said amino acids are numbered in accordance with the amino acid numbering of the *S. mutans* glucosyltransferase-B protein and wherein said immunogenic composition does not comprise intact *S. mutans* glucosyltransferase-B protein.

24. (Amended) An immunogenic composition comprising at least two peptides covalently attached to a peptidyl core matrix, wherein each peptide is an amino acid sequence subunit of *S. mutans* glucosyltransferase-B which is of sufficient length to raise an immune response in a mammal to whom it is administered comprising an amino acid selected from the group consisting of aspartate 562, aspartate 567, histidine 561, tryptophan 491, glutamate 489, and combinations thereof, wherein said amino acids are numbered in accordance with the amino acid numbering of the *S. mutans* glucosyltransferase-B protein and wherein said immunogenic composition does not comprise intact *S. mutans* glucosyltransferase-B protein.

31. (Amended) An immunogenic composition comprising at least one peptide which is an amino acid sequence subunit of *S. mutans* glucosyltransferase-C which is of sufficient length to raise an immune response in a mammal to whom it is administered comprising an amino acid selected from the group consisting of aspartate 586, aspartate 591, histidine 585, tryptophan 517, glutamate 515, and combinations thereof, wherein said amino acids are numbered in accordance with the amino acid numbering of the *S. mutans* glucosyltransferase-C protein and wherein said immunogenic composition does not comprise intact *S. mutans* glucosyltransferase-C protein.

34. (Amended) An immunogenic composition comprising at least two peptides covalently attached to a peptidyl core matrix, wherein each peptide is an amino acid sequence subunit of *S. mutans* glucosyltransferase-C which is of sufficient length to raise an immune response in a mammal to whom it is administered comprising an amino acid selected from the group consisting of aspartate 586, aspartate 591, histidine 585, tryptophan 517, glutamate 515 and combinations thereof, wherein said amino acids are numbered in accordance with the amino acid numbering of the *S. mutans* glucosyltransferase-C protein and wherein said immunogenic composition does not comprise intact *S. mutans* glucosyltransferase-C protein.

41. (Amended) An immunogenic composition comprising at least one peptide which is an amino acid sequence subunit of *S. mutans* glucosyltransferase-D which is of sufficient length to raise an immune response in a mammal to whom it is administered comprising an amino acid selected from the group consisting of tyrosine 587, aspartate 582, histidine 581, tryptophan 505, glutamate 503 and combinations thereof, wherein said amino acids are numbered in accordance with the amino acid numbering of the *S. mutans* glucosyltransferase-D protein and wherein said immunogenic composition does not comprise intact *S. mutans* glucosyltransferase-D protein.

44. (Amended) An immunogenic composition comprising at least two peptides covalently attached to a peptidyl core matrix, wherein each peptide is an amino acid sequence subunit of *S. mutans* glucosyltransferase-D which is of sufficient length to raise an immune response in a mammal to whom it is administered comprising an amino acid selected from the group consisting of tyrosine 587, aspartate 582, histidine 581, tryptophan 505, glutamate 503 and combinations thereof, wherein said amino acids are numbered in accordance with the amino acid numbering of the *S. mutans* glucosyltransferase-D protein and wherein said immunogenic composition does not comprise intact *S. mutans* glucosyltransferase-D protein.

51. (Amended) An immunogenic composition comprising at least one peptide which is an amino acid sequence subunit of *S. downei* glucosyltransferase-S which is of sufficient length to raise an immune response in a mammal to whom it is administered comprising an amino acid

selected from the group consisting of tyrosine 550, aspartate 545, histidine 544, tryptophan 478, glutamate 476 and combinations thereof, wherein said amino acids are numbered in accordance with the amino acid numbering of the *S. downei* glucosyltransferase-S protein and wherein said immunogenic composition does not comprise intact *S. downei* glucosyltransferase-S protein.

54. (Amended) An immunogenic composition comprising at least two peptides covalently attached to a peptidyl core matrix, wherein each peptide is an amino acid sequence subunit of *S. downei* glucosyltransferase-S which is of sufficient length to raise an immune response in a mammal to whom it is administered comprising an amino acid selected from the group consisting of tyrosine 550, aspartate 545, histidine 544, tryptophan 478, glutamate 476, and combinations thereof, wherein said amino acids are numbered in accordance with the amino acid numbering of the *S. downei* glucosyltransferase-S protein and wherein said immunogenic composition does not comprise intact *S. downei* glucosyltransferase-S protein.

61. (Amended) An immunogenic composition comprising at least one peptide which is an amino acid sequence subunit of *S. downei* glucosyltransferase-I which is of sufficient length to raise an immune response in a mammal to whom it is administered comprising an amino acid selected from the group consisting of aspartate 562, aspartate 567, histidine 561, tryptophan 493, glutamate 491 and combinations thereof, wherein said amino acids are numbered in accordance with the amino acid numbering of the *S. downei* glucosyltransferase-I protein and wherein said immunogenic composition does not comprise intact *S. downei* glucosyltransferase-I protein.

64. (Amended) An immunogenic composition comprising at least two peptides covalently attached to a peptidyl core matrix, wherein each peptide is an amino acid sequence subunit of *S. downei* glucosyltransferase-I which is of sufficient length to raise an immune response in a mammal to whom it is administered comprising an amino acid selected from the group consisting of aspartate 562, aspartate 567, histidine 561, tryptophan 493, glutamate 491, and combinations thereof, wherein said amino acids are numbered in accordance with the amino

acid numbering of the *S. downei* glucosyltransferase-I protein and wherein said immunogenic composition does not comprise intact *S. downei* glucosyltransferase-I protein.

71. (Amended) An immunogenic composition comprising at least one peptide which is an amino acid sequence subunit of *S. sobrinus* glucosyltransferase-2 which is of sufficient length to raise an immune response in a mammal to whom it is administered comprising an amino acid selected from the group consisting of aspartate 561, aspartate 556, histidine 555, tryptophan 487, glutamate 485 and combinations thereof, wherein said amino acids are numbered in accordance with the amino acid numbering of the *S. sobrinus* glucosyltransferase-2 protein and wherein said immunogenic composition does not comprise intact *S. sobrinus* glucosyltransferase-2 protein.

74. (Amended) An immunogenic composition comprising at least two peptides covalently attached to a peptidyl core matrix, wherein each peptide is an amino acid sequence subunit of *S. sobrinus* glucosyltransferase-2 which is of sufficient length to raise an immune response in a mammal to whom it is administered comprising an amino acid selected from the group consisting of aspartate 561, aspartate 556, histidine 555, tryptophan 487, glutamate 485, and combinations thereof, wherein said amino acids are numbered in accordance with the amino acid numbering of the *S. sobrinus* glucosyltransferase-2 protein and wherein said immunogenic composition does not comprise intact *S. sobrinus* glucosyltransferase-2 protein.